of the Ohio boundary. It must have passed a little west of Alpena and between Mackinaw and Sault Ste. Marie if it continued so far without change of course. It probably passed nearly over Steubenville, Ohio, and between Wheeling, W. Va., and Washington, Pa.; but as yet I have not learned of its having been seen at any of these places or at any place near them.

If those persons who are fortunate enough to witness the passage of such a great meteor would note carefully the point of disappearance in reference to chimneys, houses, trees, poles, etc., and their own position at the time of observation, it would facilitate the determination of the path. If the meteor leaves a bright train of sparks behind it, then the observer, by walking a few steps, should at once get the highest part of the train in line with the top of a chimney or some other permanent object that can be identified at any future time, and then note accurately his own position, so that ultimately the exact azimuth and altitude can be determined. If the meteor is seen to burst, its altitude and azimuth at that moment should be determined as accurately as possible.

If we have a large number of well observed altitudes, azimuths, and the times of first and last appearance, or the time and position of the maximum apparent altitude of the meteor, then the astronomer can determine quite accurately the absolute altitude, the speed in miles per second, and the orbit of the meteor relative to the earth and the sun. A number of meteors have been thus investigated. Many of the largest have been shown to pass through our atmosphere and continue on in their courses through planetary space.

Such a large number of minute meteors, ordinarily known as shooting stars, are burned up in the atmosphere daily as to constitute a slight, barely appreciable source of heat and dust. The result is not considered as of any importance to current meteorology, but the accumulation of meteoric dust through long geologic ages may have an important relation to both the earth and the atmosphere.—ED.

RECENT PAPERS BEARING ON METEOROLOGY.

DR. W. F. R. PHILLIPS, Librarian, etc.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a ——.

Scientific American. New York. Vol. 90.

Serviss, Garrett P. Soaring Flight. P. 343.

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Harmon, H. W. Electrically-registering Wind Vane and Anemometer for school use. P. 23713.

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Ellis, William. Some weather prophets. Pp. 43–47.

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Cornish, Vaughan. On the Dimensions of Deep-Sea Waves, and their relation to Meteorological and Geographical Conditions. Pp. 623–645.

Terrestrial Magnetism and Atmospheric Electricity. Baltimore. Vol. 9.

Bauer, L. A. Magnetic Storm of October 31–November 1, 1903, recorded at the Coast and Geodetic Survey Magnetic Observatories. Pp. 25–27.

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Ward, Robert DeC. "Sensible Temperatures." Pp. 129–138.

Review of Reviews. London. Vol. 29.

Waldo, Frank. Climatic Features of the Field of the Russo-Japanese War. Pp. 582–584.

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Haupt, Lewis M. The Mississippi River Problem. Pp. 71–96.

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Mawley, Edward. Report on the Phenological Observations for 1903. Pp. 123–153.

Dines, W. H. Observations by Means of Kites at Crinan in the summer of 1903. Pp. 155–166.

Strachan, Richard. Climatic Influence on Vineyards. Pp. 173–175.

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Lugard, F. D. Climate of Northern Nigeria. Pp. 179–180.

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Journal de Physique. Paris. 4me séries. Tome 3.

Nordmann, Ch. Le rayonnement hertzien du soleil et les aurores boréales. Pp. 281–316.

La Nature. Paris. 32me année.

R. C. Le temps en Islande et le temps en Europe occidentale. P. 322.

Plumandon, J. R. Les crépuscules rouges. Pp. 325–328.

M., P. de. La foudre et les clôtures métalliques. P. 336.

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Angot, A. Les observations météorologiques de la mission saharienne Foureau-Lamy. Pp. 1–4.

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Bebber, W. J. van. Bemerkenswerte Stürme. Weitere Folge. I. Sturm vom 6. bis 8. April 1904. Pp. 195–198.

—— Ergebnisse der meteorologischen Beobachtungen in Tsingtau September 1898 bis August 1903. Pp. 198–204.

Wegemann, G. Einfluss des Windes und Luftdrucks auf die Gezeiten. Pp. 204–208.

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Archenhold, F. S. Die Temperatur der Luft über Berlin. Pp. 272–273.

Wiener Luftschiffer-Zeitung. Wien. 3 Jahrgang.

Silberer, Victor. Grundzüge der praktischen Luftschiffahrt. Pp. 77–80.

Annalen der Physik. Leipzig. Vierte Folge. Band 13.

Mie, Gustav. Der elektrische Strom in ionisierter Luft in einem ebenen Kondensator. Pp. 857–889.

Meteorologische Zeitschrift. Wien. Band 21.

Prohaska, K. Das Hochwasser vom 13 zum 14 September in den Ostalpen. Pp. 153–162.

Exner, F. M. Einige Untersuchungen über Sonnenstrahlung. Pp. 162–169.

Draenert, F. M. Das Klima von Blumenau im Staate Santa Catharina, Brasilien. Pp. 169–175.

Süring, R. Barometervergleichungen der meteorologischen Institute in Berlin und Wien. Pp. 177–178.

Hann, J. Täglicher Gang des Barometers zu Ponta Delgada, S. Miguel, Azoren. Pp. 178–179.

Polis, P. Ergebnisse der täglichen Periode der Lufttemperatur und die Erdbodentemperatur von Aachen 1896–1900. Pp. 179–181.

Hegyfoky, J. Häufigkeit der W.-und E.-Luftströmung in Ungarn. Pp. 182–185.

—— Resultate der meteorologischen Beobachtungen auf dem Mont Ventoux in den Jahren 1901 und 1902. Pp. 185–186.

—— Regenfall in Cherra Poonjee. Pp. 186–187.

—— Klima von Merzifun, Kleinasien. P. 187.

Bergholz, — Regenfall in Ceylon. Pp. 187–188.

—— Resultate der meteorologischen Beobachtungen zu Zi-ka-wei 1873 bis 1900. Pp. 188–189.

—— Täglicher Gang der Temperatur zu Zi-ka-wei. P. 189.

—— Regenfall zu Funchal auf Madeira 1896–1901. P. 190.

—— Regenmessungen auf der Pflanzung Ngambo (Deutsch-Ostafrica) in den Jahren 1898–1901. Pp. 190–191.

—— Resultate der meteorologischen Beobachtungen zu Majunga (Madagaskar) im Jahre 1900. Pp. 191–192.

—— Resultate der Regenmessungen auf den Karolinen und Palau-Inseln. Pp. 192–193.

—— Meteorologischen Beobachtungen, angestellt in Yap (Karolinen) vom 1 Dezember 1899–22 Juni 1900, von Prof. Dr. G. Volkens. Pp. 193–194.

—— Regenfall in Nieder-Kalifornien. Pp. 194–196.

—— Regenfall zu Sucre (Bolivien). P. 196.

Hann, J. N.-Föhn zu St. Andrä im Lavanttale. P. 196.

Knipping, E. Formel zur Umwandlung der Beaufort-Grade in Metermass. Pp. 196–197.

Dorn, — Eine Beobachtung des "grünen Strahls." P. 197.
Hann, J. Sonnenschein in Wien im Winter 1903–1904. Pp. 197–198.
Wolfer, A. Provisorische Sonenflecken-Relativzahlen. P. 198.
Das Wetter. Berlin. 21 Jahrgang.
Walter, Gustav. Der Wert der Beobachtungen auf dem Ben Nevis in Schottland für die Wetterprognosen. Pp. 81–84.
—— Eine elektro-magnetische Theorie des Nordlichtes. Pp. 92–93.
Gaea. Leipzig. 40 Jahrgang.
—— Luftelektrizität und Erdladung. [Abstract of work of H. Ebert.] Pp. 330–335.
—— Die klimatischen Verhaltnisse der Mandschurei. Pp. 374–375.

BAROMETRIC PRESSURE AT ORONO, ME.

By Prof. JAMES S. STEVENS, dated Orono, Me., April 12, 1904.

Referring to my previous paper in the MONTHLY WEATHER REVIEW, November, 1903, p. 528, I may say that the meteorological station at Orono, Me., is connected with the Maine State College, now the University of Maine. Its records begin with January 1, 1869. Up to the year 1892, inclusive, they were kept by Dr. M. C. Fernald, then president of the college. Since that time they have been in charge of the Maine Agricultural Experiment Station. In 1893, and subsequently, some of the observations were omitted, and the methods of recording were not entirely uniform. I have undertaken to summarize the results for publication, and the subjects treated will appear from time to time in the following order: Barometry, thermometry, moisture, prevailing winds, wind velocity, cloudiness, general atmospheric conditions, optical and electrical phenomena conclusions.

1. *Barometry.*—The instrument used in the earlier period of these observations was made by J. S. F. Huddleston of Boston, Mass. It was twice compared with a standard instrument, and the error was regarded as small enough to be negligible, but was considered when making the observation. In later years the barometer used was one manufactured by James Green of New York City. It had an error of 0.003, and this error was always considered in recording. Recent standardization shows this barometer to have a negligible error. The times of observation were 7 a. m., 2 p. m., and 9 p. m. The altitude above sea level, as determined by means of the spirit level, was 134 feet from January, 1869, to June 11, 1879, and 129 feet from that time to January, 1893; during the remainder of the period to the present time it is 148 feet. The dates of the missing records were as follows: 1869, June and December; 1893, two-thirds of January; 1895, January and December; 1896, January, February, and June. From October, 1899 to 1903, inclusive, observations were made at 2 p. m. only.

The means published herewith have been reduced to the standard instrumental temperature. The latitude is 44° 54′ north and altitude small; therefore the gravity corrections may be neglected as being probably zero. The observations have been reduced to sea level by the formulæ and tables given in the Weather Bureau Instructions to Voluntary Observers. In order to take annual and other means I have thought it best to give in italics the best values I could obtain by interpolation between the months contiguous to those for which the data were fragmentary or missing. The means depend in part, therefore, upon graphic interpolations, using the monthly charts of the MONTHLY WEATHER REVIEW for that purpose. The year 1896 was rejected in taking the average.

The figures are the hundredths of an inch and range from 29.54 to 30.12. The figures in italics in Table 1 imply that a number of observations were missing.

TABLE 2.—*Monthly and annual barometric pressure at 2 p. m. at Orono, Me.*

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900..	75	77	71	72	74	72	72	92	85	98	82	81
1901..	75	50	71	...	...	...	...	...	85	87	72	83
1902..	82	58	76	71	77	65	79	74	92	82	84	84
1903..	68	73	04	70	95	85	67	86	90	85	78	74

TABLE 1.—*Monthly and annual barometric pressure at Orono, Me., reduced to sea level and standard gravity.*

	January.				February.				March.				April.			
	7 a.	2 p.	9 p.	Mn.	7 a.	2 p.	9 p.	Mn.	7 a.	2 p.	9 p.	Mn.	7 a.	2 p.	9 p.	Mn.
1869........	79	74	77	77	73	69	70	71	85	81	82	83	68	64	67	66
1870........	93	90	91	91	72	68	68	69	76	74	77	76	87	84	84	85
1871........	00	01	98	99	79	76	75	77	82	75	79	79	73	70	67	70
1872........	73	69	72	71	74	69	70	71	72	68	68	70	75	72	73	73
1873........	88	86	90	88	72	68	68	69	68	67	68	68	70	70	72	72
1874........	02	98	97	99	95	91	93	93	69	63	63	65	80	74	75	76
1875........	98	92	90	94	80	78	77	78	92	87	91	91	77	72	74	75
1876........	87	83	88	86	86	81	85	83	82	77	79	79	78	73	79	76
1877	88	85	89	88	80	76	78	78	84	79	83	82	86	83	84	84
1878........	84	83	87	85	80	77	78	79	75	74	75	75	74	72	74	73
1879........	75	71	72	73	80	78	83	80	99	93	91	94	70	66	70	69
1880........	03	93	03	00	90	85	88	89	91	82	89	88	83	75	79	79
1881	95	91	92	93	02	93	98	98	59	57	59	58	65	59	64	63
1882........	91	87	96	91	94	91	98	93	92	87	91	90	88	83	84	85
1883........	06	01	02	03	05	00	05	03	77	73	73	75	89	84	88	87
1884........	98	94	93	95	00	92	94	96	89	85	86	86	70	69	71	70
1885........	91	87	80	86	80	77	77	78	86	83	85	85	89	85	85	87
1886........	93	92	95	93	86	83	83	84	77	74	74	75	05	01	02	03
1887........	88	90	87	88	06	01	02	03	76	71	74	74	88	82	83	84
1888........	93	87	89	90	93	89	94	92	85	80	86	84	95	91	95	94
1889........	87	84	85	85	91	86	93	90	75	71	72	73	87	83	85	85
1890........	05	98	98	00	95	92	97	95	84	79	82	82	96	90	91	92
1891........	90	86	89	88	92	89	92	90	02	98	00	00	82	77	80	80
1892........	90	85	88	88	02	98	03	01	75	71	75	73	84	78	82	82
1893........	*95*	*90*	*92*	*92*	93	87	89	89	91	86	89	89	95	91	93	93
1894........	00	98	98	98	98	92	97	96	92	87	89	89	91	89	89	90
1895........	*90*	*86*	*87*	*88*	73	62	54	63	78	76	74	76	90	86	89	88
1896........	...	...	...	...	...	...	...	...	04	98	97	00	04	03	06	04
1897... .	89	82	89	86	95	87	90	91	89	82	86	86	89	84	88	87
1898........	79	75	80	78	91	91	90	91	04	93	01	99	77	71	74	74
1899........	87	86	87	87	75	75	77	76	81	74	77	77	87	80	84	84
Mean	**91**	**87**	**89**	**89**	**88**	**83**	**86**	**86**	**83**	**78**	**81**	**81**	**83**	**80**	**80**	**81**

	May.				June.				July.				August.			
	7 a.	2 p.	9 p.	Mn.	7 a.	2 p.	9 p.	Mn.	7 a.	2 p.	9 p.	Mn.	7 a.	2 p.	9 p.	Mn.
1869........	65	61	63	63	*70*	*66*	*70*	*69*	75	72	74	74	84	81	81	82
1870........	81	77	79	79	84	80	80	81	78	74	75	76	83	79	80	81
1871........	69	76	71	72	74	69	71	71	78	74	77	77	81	77	78	79
1872........	75	74	74	75	79	77	76	77	79	72	72	74	85	80	81	82
1873........	83	80	79	80	80	75	76	77	82	79	80	80	90	87	87	88
1874........	73	70	69	71	71	68	67	69	82	80	79	80	85	80	82	83
1875........	79	75	75	77	82	78	82	81	78	76	76	77	91	88	89	89
1876........	84	80	84	82	84	81	84	83	79	76	78	78	89	85	87	87
1877	77	74	76	75	78	79	79	79	79	76	76	77	82	79	80	80
1878........	78	74	77	76	80	77	78	78	83	88	83	84	76	74	75	75
1879........	82	87	94	88	79	76	78	77	81	78	79	79	80	76	78	77
1880........	87	84	87	86	84	80	82	82	80	78	79	79	91	87	89	89
1881	98	94	95	96	78	74	76	76	79	75	77	77	87	83	85	85
1882........	92	86	88	89	73	68	70	70	86	82	84	84	91	86	88	89
1883........	90	84	86	87	88	85	85	86	82	79	80	81	89	85	87	87
1884........	82	79	81	81	98	92	91	94	71	68	66	68	94	92	93	93
1885........	93	88	90	90	83	79	79	81	85	81	83	83	88	86	85	86
1886........	82	78	79	80	87	83	85	85	85	81	81	83	86	84	84	85
1887........	97	93	92	94	95	92	91	93	87	84	85	85	88	85	86	86
1888........	91	87	89	89	78	74	77	76	83	78	80	80	79	77	80	79
1889........	83	79	82	81	88	83	85	85	85	83	83	84	93	90	91	92
1890........	87	83	84	85	84	81	83	82	89	85	86	87	87	84	86	85
1891........	89	85	88	87	82	79	80	80	88	86	87	87	90	86	88	88
1892........	86	82	85	84	86	82	82	84	88	86	86	86	91	88	89	89
1893........	78	74	75	76	92	90	90	91	76	77	74	75	83	80	79	81
1894........	88	81	86	85	82	78	78	79	85	80	82	82	88	84	86	86
1895........	85	85	87	86	95	93	89	92	85	89	84	86	84	91	88	88
1896........	98	99	96	98	...	...	...	...	96	93	94	94	00	97	94	97
1897... .	84	78	80	81	77	70	82	77	84	82	83	83	79	76	77	77
1898........	83	77	79	80	80	76	79	78	88	83	85	85	81	77	79	79
1899........	86	81	83	83	81	77	80	79	77	73	76	75	85	81	84	83
Mean	**89**	**88**	**89**	**89**	**81**	**79**	**79**	**80**	**82**	**79**	**80**	**80**	**86**	**83**	**84**	**84**

	September.				October.				November.				December.			
	7 a.	2 p.	9 p.	Mn.	7 a.	2 p.	9 p.	Mn.	7 a.	2 p.	9 p.	Mn.	7 a.	2 p.	9 p.	Mn.
1869........	00	96	98	98	76	73	77	75	76	72	74	74	*75*	*70*	*68*	*68*
1870........	95	92	93	93	88	82	83	84	71	68	72	70	67	64	65	65
1871........	91	87	88	89	86	87	84	86	73	73	73	73	79	78	80	79
1872........	85	82	82	83	89	87	87	88	81	77	78	79	82	81	84	82
1873........	89	86	85	86	92	82	86	86	65	70	71	69	90	89	89	89
1874........	94	88	92	92	87	84	84	85	95	90	90	92	91	85	91	89
1875........	83	77	79	79	80	79	80	80	82	82	81	81	79	75	76	77
1876........	84	82	83	83	78	71	73	76	83	79	81	81	69	70	72	70
1877	90	85	88	88	93	88	88	89	96	93	94	94	95	92	94	94
1878........	02	99	01	01	87	84	84	85	74	72	74	73	80	77	80	79
1879........	99	95	96	96	92	88	91	90	94	90	93	92	02	00	04	03
1880........	86	85	87	86	93	89	91	91	01	00	01	01	80	78	79	79
1881	00	96	98	98	95	95	96	95	98	94	95	96	00	96	97	98
1882........	97	94	96	96	01	94	95	97	98	95	95	96	89	85	89	88
1883........	95	91	93	93	06	03	05	05	94	93	95	94	97	91	92	93
1884........	95	90	93	93	97	92	95	95	88	87	89	88	01	98	97	99
1885........	89	87	89	88	96	92	93	93	82	80	81	81	78	78	80	79
1886........	03	94	98	98	08	03	05	05	82	82	82	82	97	94	98	96
1887........	96	93	97	95	88	83	85	85	88	79	88	85	94	91	94	93
1888........	98	94	95	96	76	73	77	75	98	95	96	96	77	74	77	76
1889........	95	91	92	93	92	89	92	91	92	88	91	90	97	93	97	96
1890........	01	99	99	00	78	74	76	76	85	83	86	85	85	84	89	86
1891........	02	98	98	99	93	88	91	91	02	99	03	02	94	90	94	93
1892........	01	97	00	00	77	73	76	75	92	89	91	91	82	75	80	79
1893........	87	88	90	88	01	92	96	96	02	97	90	96	93	89	97	92
1894........	00	06	93	99	92	82	89	88	96	81	84	87	90	03	02	98
1895........	92	87	84	87	80	81	87	83	00	00	00	00	*95*	*98*	*99*	*97*
1896........	03	99	00	0	93	94	96	94	12	10	11	11	03	05	06	05
1897... .	93	86	90	90	99	93	93	95	86	82	84	84	87	85	84	85
1898........	85	81	82	83	93	89	93	92	84	78	81	81	77	75	79	77
1899........	89	86	87	87	*06*	04	*05*	*05*	*83*	80	*81*	*81*	*86*	84	*86*	*86*
Mean	**94**	**90**	**91**	**92**	**87**	**83**	**85**	**85**	**88**	**85**	**87**	**87**	**87**	**85**	**87**	**86**